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BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

COLUMBIA, SOUTH CAROLINA

PROCEEDING #18-11727 MAY 23, 2018 10:33 A.M.

ALLOWABLE EX PARTE BRIEFING - ND-2018-15-E

Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC - Request for an Allowable Ex Parte Briefing Regarding Power/Forward Initiative

TRANSCRIPT OF ALLOWABLE PROCEEDINGS **EX PARTE BRIEFING**

COMMISSION MEMBERS PRESENT: Swain E. WHITFIELD, CHAIRMAN; Comer H. 'Randy' RANDALL, VICE CHAIRMAN; and COMMISSIONERS John E. 'Butch' HOWARD, Elliott F. ELAM, Jr., Elizabeth B. 'Lib' FLEMING, Robert T. 'Bob' BOCKMAN, and G. O'Neal HAMILTON

ADVISOR TO COMMISSION: Joseph Melchers, Esq.
General Counsel

STAFF: Jocelyn G. Boyd, Esq., Chief Clerk/Administrator; F. David Butler, Esq., Senior Counsel; James Spearman, Ph.D., Executive Assistant to Commissioners; B. Randall Dong, Esq., Josh Minges, Esq., and David W. Stark, III, Esq., Legal Advisory Staff; Douglas K. Pratt, Thomas Ellison, and John Powers, Technical Advisory Staff; Jo Elizabeth M. Wheat, CVR-CM/M-GNSC, Court Reporter; and Afton Ellison, Hope Adams, and Calvin Woods, Hearing Room Assistants

APPEARANCES:

HEATHER SHIRLEY SMITH, ESQUIRE, representing and ***Bobby Simpson*** [Director, Grid Improvement Plan Integration / Duke Energy] presenting for **DUKE ENERGY CAROLINAS, LLC, AND DUKE ENERGY PROGRESS, LLC**

JEFFREY M. NELSON, ESQUIRE, representing the **SOUTH CAROLINA OFFICE OF REGULATORY STAFF**

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Note: For identification of any additional referenced materials and/or links for same, please see Certification correspondence filed by the Office of Regulatory Staff.

Please note the following inclusions/attachments to the record:

- PowerPoint Presentation Slides (PDF)
- *The Economic Impact of Duke Energy: A Statewide and Regional Analysis*
- *Power/Forward Carolinas: A 10-Year Plan to Modernize South Carolina's Energy Grid*

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P R O C E E D I N G S

CHAIRMAN WHITFIELD: Please be seated. I'll call this allowable ex parte briefing to order and ask our attorney, Mr. Melchers, to read the docket. And then we'll hear from South Carolina Office of Regulatory Staff.

Mr. Melchers?

MR. MELCHERS: Thank you, Mr. Chairman.

And, Commissioners, we're here pursuant to a Notice of Request for Allowable Ex Parte Communication Briefing.

The parties requesting the briefing are Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC. The briefing is scheduled for today, here in the Commission hearing room, May 23rd, 10:30 a.m. And the subject matter to be discussed at the briefing today is: The Power/Forward Initiative.

Thank you, Mr. Chairman.

CHAIRMAN WHITFIELD: Thank you, Mr. Melchers.

Mr. Nelson, South Carolina Office of Regulatory Staff.

MR. NELSON: Good morning, Mr. Chairman. Thank you.

Commissioners and everybody else, my name is Jeff Nelson, if you don't know me, and I'm Chief

Counsel for the Office of Regulatory Staff. I'm here today as the designee of the Executive Director of the Office of Regulatory Staff at this allowable ex parte briefing being presented by Duke Energy Carolinas and Duke Energy Progress.

It is to be conducted in accordance with the provisions of South Carolina Code Annotated Section 58-3-260(C).

As the ORS representative, it's my duty to certify the record of this proceeding to the Chief Clerk of the Public Service Commission, Ms. Boyd, within the next 72 hours, and to verify that this briefing was conducted in accordance with the provisions of 58-3-260.

The requirements of that statute are, in part, that the allowable ex parte be confined to the subject matter which has been noticed, and on this basis, as Mr. Melchers has already indicated, the subject is the Power/Forward Initiative. Therefore, I would ask that the presenters and Commissioners and Staff all please attempt to refrain from discussing any matters not specifically related to that topic.

Under the provisions of 58-3-260(C), participants, Commissioners, and Commission Staff

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are prohibited from requesting or giving any commitment, predetermination, or prediction regarding any action by any Commissioner as to any ultimate or penultimate issue which is before or is likely to come before the Commission. I ask the presenters, Commissioners, and Staff try and refrain from referencing any reports, articles, statutes, or documents of any kind that are not specifically included in today's materials. I notice that the company has provided both the briefing materials, as well as two other documents today. Anything outside of those, we would ask you please try and refrain from referring to, because we would have to get copies of those and then we'd have to provide those in the record, and we have a very short turnaround time when we need to provide these documents.

Finally, I would ask everybody in attendance today, please read and sign the form which you should've picked up. You should've both signed in when you came in and you should have picked up a form. I ask you please read and sign those, and make sure they get turned back in before you leave this morning.

Thank you. That's all I have, Mr. Chairman.

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CHAIRMAN WHITFIELD: Thank you Mr. Nelson. Ms. Smith?

MS. SMITH: Good morning. As Mr. Nelson mentioned, we have provided some documents to the Commission. One, of course, is the presentation that Mr. Simpson will walk through. The other two documents were recently referred to by Mr. Simpson at our workforce development ex parte. These two documents were filed with the Commission in connection with that ex parte, as you can note from the filing stamp, and Mr. Simpson will refer to these documents, and we wanted to provide them to you today for your convenience. For others in the room, we have brought extra copies if a member of the public is also interested in seeing them.

And with that, I'm happy to turn it over to Mr. Simpson.

MR. BOBBY SIMPSON [DUKE]: Good morning.

CHAIRMAN WHITFIELD: Thank you, Ms. Smith.

MR. BOBBY SIMPSON [DUKE]: Can you hear me on the microphone? I want to make sure before we get started. Okay.

[Reference: Presentation Slide 1]

Well, thanks for taking the time to meet with us again. We were here just a few weeks ago, so we

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really do appreciate you taking the time to listen to what we want to talk about with respect to Power/Forward Carolinas. And I mentioned the last time I was here – I described my role as one who is responsible to make sure the grid is fit for the future. And just to kind of refresh on that, what that means is a smart-thinking energy grid that's strong enough to weather storms, physical and cyber-security, one that's intelligent enough to anticipate power outages and restore service automatically, and then one that's flexible enough to enable renewable technologies and then meet the changing energy needs that we're seeing in years ahead.

So our commitment to you is we want to be transparent and help develop an understanding as to why Power/Forward is important to do and what it consists of, and also to listen and explore your feedback.

So the presentation today will be kind of in two parts, and the intended takeaways are – you know, the first part would be to talk about the vision and the problem statements. So how did we arrive at this vision? What problems are we trying to solve? What opportunities are we pursuing, and

what are the benefits?

The second part will focus on the proposed solution, so those takeaways would be: What decision-making process did we use? What is our rationale for doing what we're doing? And then how did we assign dollars and how flexible is the plan? And you will recall from the last ex parte on workforce development, you know, those takeaways were, you know, that this is a people-driven transformation of the grid. It'll support thousands of jobs in the communities across the State, and we are very actively involved in recruiting and training to fill the workforce development pipeline.

[Reference: Presentation Slide 2]

So I'd like to start with a story here. So, this took place in 1992 in a little town called Olanta, near Florence. And at that time, I was the Florence district manager for what was then CP&L. And I was out with a line crew on this particular day, and we were building a power line across a soybean field to serve an irrigation pump. And while we were doing that, the farmer who owned the land came driving up over the ruts in his truck, got out, and said, "Hey, when you get finished, can

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you come get my lights on?" We said, "Yes, sir. How long have they been out?" And he said, "Oh, about a week." And the whole point is, this man's standard practice was, when he saw a truck while he was riding his fields, he would come and, if he had an issue that the company needed to know about, he'd tell us, and that's the way he worked. So his mindset was to be adaptive and self-sufficient.

And I share this story just to contrast it with what we all know is true today, and that is, you know, minutes after power goes out anywhere, people start twittering about it, and I think the mindset is to kind of shut down and wait for it to get back on, and things come to a standstill.

So, you know, the words on this slide here — "What got you here won't get you there" — is the name of a book by a leadership coach by the name of Marshall Goldsmith. And the reason I wanted to use that, because my takeaways from that book really apply here with what we're doing, and that is, we take our responsibility to serve very seriously and we care about getting better as a utility in the industry.

[Reference: Presentation Slide 3]

And so this slide, you saw last time. And I

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just wanted to reiterate a few points here. We all know that technology's transforming South Carolina. It's really hard to find a key social structure that's not dependent upon electricity. What we're seeing is that customers' needs have changed, and they've grown beyond what today's grid was designed to do, because customers want a new experience and, with the electric power grid really being the backbone of our State's digital economy, customers deserve an energy grid that's reliable and that is built to weather the storms. And to make all of these things happen that we think are necessary for the future, there's three or four things we have to think about that I'm going to talk about in some detail: Reliability, reducing consumer/customer disruption and being ready for severe weather, really before it strikes; number two, being vigilant and preparing now for physical and cyber-attacks, which are a very real threat; responding to growing consumer expectations; and, finally, with renewable energy technologies, as they become more affordable and accessible, it's something that's really good for the future, but they're having a profound impact on the way the grid operates. So we have to take steps now to ready

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the grid to support this growth. So, for us, it's no longer about powering lights, as it was in the '90s; it's really about powering lives.

[Reference: Presentation Slide 4]

So we find ourselves at a fork in the road where the left-hand turn is maintaining our grid components, and it's what we do every year; we maintain the grid year over year, so we invest in that and we refer to it often is "customary spin," but it's the investment in maintaining the grid that we make to make sure the assets are used and useful. And it is a well-maintained grid. But the grid is a machine, and wear and tear is happening on the grid and it's becoming less resilient, and there's evidence of that. The evidence is in the metric that we call SAIDI, S-A-I-D-I, which I'm going to explain in more detail in a minute, but that's one of the indicators that things are changing.

So we're seeing a worsening trend; it's been statistically validated. And so our conclusion is that maintaining today's infrastructure is really not the solution, going forward. And so we need to make this right-hand turn and go down the road of transformation, and that's what Power/Forward

Carolinas is about; it's about transforming the grid to the 21st century. And so what that means, specifically, is a grid that's more flexible and accessible, hardened and resilient, secure, and a smarter grid. And to be more specific, it's adding things like two-way power flow; it's turning the reliability trend from worsening to improving; it's installing smart-thinking grid features; and it's integrating wires and non-wires approaches to the way the grid works.

So Power/Forward Carolinas, it's a broad-reaching, diverse portfolio of elements that work together, and it's investing in the right thing in the right place on the grid to get the right outcome. So it's got to be transformed over a period of time to integrate with the future, and we just have to do more to anticipate what customers want and need, and we have to avoid the reliability issues that we believe lie ahead if we don't take action today.

So, the way I've described the left-hand turn is more like maintaining the road; the right-hand turn is about building a better energy highway, is a way to think about it. So the reality is that today's grid, while it's well-maintained, is simply

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not engineered to handle the growth that we're seeing in renewables and some of the weather impacts.

[Reference: Presentation Slide 5]

So, while many of these benefits might seem intuitive, what may not be clear is why we didn't make these investments before, why are we building Power/Forward now. It really starts with what we can see now versus what we could see just a few years ago. So for a plan like Power/Forward to be successful, it has to be built on reliable data. And, so, data is at the heart of what we're doing here, and we have a whole team of data scientists that are working to help us figure out the most cost-effective thing to do with the grid.

So we've got substantial knowledge now, information, and expertise around what works and the positive impacts that implementing improvements in scale on the grid can have on performance. So we just didn't have a powerful enough lens with the data in the past to see beyond the system average and define the problems at individual points and subsystems of the grid. So I'll talk about the subsystems of the grid here in a minute. And even if we did, if we did identify points to improve,

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the technologies that were needed to make those improvements were still being invented in the utility industry.

So here's a way to think about it: If you go back to 2007, that's when we started putting a lot of devices out on the grid. You know, the grid is a 50-something thousand square miles of geography it serves. We put thousands of devices out on the grid. And when you do that, you know, you can communicate with them and it brings a lot of data in. So IT people call that big data. So we had — we're gathering all this data, but the ability to analyze it and do that efficiently in a way that you can make really good, informed decisions is something that has only recently become — we've been able to do. And we've done that by leveraging the solutions that the businesses that have data as their business model — like the Amazons and the Googles, they're the ones that figured out how do you really harness data and process huge amounts of data to make informed decisions. So that'll just give you a feel for it has really been in the recent past that the data and the capability has come to bear, and we are applying that now.

So the advanced communication and networking

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technologies, automated restoration capabilities, grid management systems, which you might think of as the brain of the grid, these are technologies that have been evolving concepts to practical application, and they're coming to bear now. And the advanced predictive analytics that I just described have recently come to bear. So we've been able to leverage that and translate that into how do you build a smart-thinking grid.

[Reference: Presentation Slide 6]

So Power/Forward Carolinas, we think of it as an intelligent blueprint for the future. It's built on millions of data points to tell us clearly and precisely where to make the right investments to maximize benefits. And by targeting these investments, we can keep costs lower for customers while preparing the grid for new technologies that will benefit communities and the environment in the State. So data is the foundation of the smart-thinking grid.

[Reference: Presentation Slide 7]

So I want to shift gears here a little bit and talk not only about the need for Power/Forward but talk about the benefits. I'll be on this slide for a while, because I think it's really important to

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put things in perspective. So I said a minute ago that the grid is a machine and that, like any machine, the more stress it experiences, the less resilient it becomes. And so what's happening here, there's a couple of things going on that we've been looking into that are putting new demands and more wear and tear on the grid. The evidence is showing up in the number of outage events that are happening. And the way we measure that is a metric that we call SAIDI. So the acronym is S-A-I-D-I, SAIDI. It stands for system average interruption duration index. It's an IEEE metric, IEEE being the Institute of Electrical and Electronics Engineers. And it's a measure, frankly, that doesn't mean anything to most people, but it means a lot to us, because we use that to make informed decisions about how, where, and when to invest. So it's really important, from that standpoint.

So here's a way to think about it, the math behind it: What it's telling you is how long is the average customer out in a year — keyword being "average." So, think of it this way: So we have 60-70,000 outages that happen in a year. So if you think of the whole grid, lights go out upwards of

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60-70,000 times over the course of the year, and that would be the whole Carolinas system. And we measure that in terms of customer minutes of interruption, so, for example, if one customer was out for an hour, that's 60 customer minutes of interruption. If 1000 customers were out for four hours, that's 1000 customers times 240 minutes: 240,000 customer minutes of interruption.

So all those outages create customer minutes of interruption; you add all of those up over the course of the year, and that's the numerator of SAIDI. You divide it by the number of customers served, and it gives you that average.

So I wanted to explain exactly how that works, and if you look at this graph here, on the left-hand side is DEP, on the right-hand side is DEC. And so DEP is about 239, so that's around four hours. So the average customer's out four hours in DEP. And for Duke Energy Carolinas, it's 169, so that's a little bit less than three hours. I just wanted to explain what you're looking at, here, in terms of the graph. And those are the 2017 numbers that I just described.

So what we're showing here is a projection of where reliability will go, if we keep doing what

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we're doing on, the left-hand side of the road. So the forecasted worsening increase over the next 10 years is without Power/Forward. The forecast that's in blue is with Power/Forward. And that's really the point of this whole slide, and that is the benefit.

So I want to talk a little bit about what's driving that. So we have seen a significant increase in severe weather events in recent years, and that's one of the things causing more wear and tear on the grid. And we asked ourselves about the weather, is it different? Is it having an impact, and does it matter? And we engaged a research economist and academic to do a statistical evaluation to take a hard look at this.

And just a few quick data points when it comes to the weather: When you look at what meteorologists call convective weather events, convective weather events are — you might think of them as thunderstorms, but they're events that create damaging winds and extreme precipitation. So in the U.S., those events over the past 20 years are up 40 percent. In the Southeast, it's almost doubled. In North and South Carolina, it's more than doubled since the year 2000. And if you look

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at the DEP and DEC area, these events are up 31 percent since the year 2006. So that's the weather, just looking at the weather in terms of is it different. And then we looked at the statistical correlations. This is why we engaged a statistician. And the correlation is what a statistician says is strong. And what that means is, more than half of the variation in the outage events that we're seeing can be explained by the number of changes in these convective weather events. And that is unusual, for a single factor to capture more than 50 percent of the change.

So a way to think about that is a real estate example. So, in real estate, when pricing houses, you know, there's a number of things that real estate agents use to price a house: location, comparables, square footage, those types of things. And it usually takes four or five variables to influence significantly the price of a house. This is a case where one variable is having over 50 percent of the impact. So I just wanted to try and put that into context.

So if you look this graph here again, what we've seen — and there's two windows of time we're looking at. So what's happened with the

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reliability between 2006 and 2012, compared to what's happened to reliability between 2013 and 2017. So in DEP, we've had a flat to slightly improving trend between the years 2006 and 2012, but since 2013 it's worsened by about 1½ percent. If you look at DEC, it's more dramatic. So in DEC, between 2006 and 2012, the reliability performance – SAIDI – was improving by 4 percent, but since 2013 it's worsened by 6 percent.

So the conclusion is that there's a 95 percent confidence level that this is not random or chance and it will continue to worsen, that there's been a clear change in the data pattern. We kind of refer to this as the new normal. So we can see, over a period of 10 years, anywhere from a 35 to a 50 percent worsening in the reliability performance, and so we see this as an opportunity to act now.

So that's the weather. I wanted to talk a minute about renewables. So we've also seen a tremendous growth in renewable energy across the State. We're seeing increased adoption of emerging technologies that are putting new demands on the system. And while they've introduced a lot of positive benefits, they've also introduced intermittent two-way power flow to a system that

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was engineered and designed for one-way power flow.

So just a couple of things to put that in perspective: So the number of megawatts on our distribution grid is around 2000, right now, today. And there's about 2500 megawatts in the queue that are being studied. And we have validated that there's more solar megawatts on the distribution grid, on Duke Energy's distribution grid, than of any other utility in the country. And that's really because we've always been open and tried to promote the integration of renewables, dating all the way back to 2007 when things just started to ramp up in that space. But it's starting to tax the grid and put a strain on it, and there's reliability issues that we're seeing that range from voltage flicker that causes equipment regulators to operate real frequently, so that's a wear-and-tear example, we're seeing higher losses on the grid, and we're seeing this thing called magnetizing in-rush. So when solar comes on, if there's enough concentration in an area, it's kind of like if you have a water hose and you've got the water turned on at the spigot, and you hit the nozzle and the water bursts out until it stabilizes. When solar transformers come on,

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that's the kind of hit they make to the grid, which can create more wear and tear. I just wanted to try and give some practical examples.

So, while the system can maintain a certain amount of these new technologies, as I said, the reality is the grid wasn't engineered for what amounts to two-way power flow. So just to kind of wrap up the story here, you know, just from the statistics, because I think this is an important part of it, statistical analysis looked at whether the trend in reliability is different in one period of time compared to another; the answer is yes. We're finding that it's gone from flat, to improving, to worsening. We saw the change starting to happen in 2012 and, since it occurred, it's continuing. And so the research is telling us that there's a 95 percent confidence level it's not random or chance and it'll continue for the reasons I've described.

So, really, a point I want to make here is, if you go back to the fork-in-the-road analogy, we've got evidence that's emerged to only continue maintaining the grid, we're concerned we're going to have disruption that will not be acceptable in the future, that could even be threatening, whereas

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the right-hand turn is opportunity. And what opportunity really means is, we see it and we've got time to change it if we act now. In fact, that's really my bottom-line point: So the benefit being, Power/Forward can improve core reliability by 40 to 60 percent.

[Reference: Presentation Slide 8]

So another set of benefits I wanted to mention is with major storms. So, Power/Forward does reduce major storm impacts. So if you look at the text just to the left of the picture here, it's talking about major storm impacts in the Carolinas. And so homes and businesses that are impacted annually by major-event days — so here's another acronym, MED, and it stands for major event days — what those are is these are cases where you have these big storms that create so many outage events so quickly that you've got a lot in the queue and you've got a lot of damage and it's a multi-day storm restoration effort, and mobilizing resources across your own service area or from other utilities is essentially mandatory to minimize the number of days these things take to restore power. So on average, homes and businesses in South Carolina experience 12 hours of interruption from

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these things. And to put it in context – so there's a lot of numbers on this slide, but let's just pick one. So if you look at, in the far right at the top, you see "210 million customer minutes of interruption"? We've already talked about customer minutes of interruption, so I think it's a good number to use. So what this is showing is the yearly average for the past 10 years of customer minutes of interruption in South Carolina because of these major storm events I just described; it's 210 million. So let's – let me just elaborate on that a bit. So these major storms, it's not a huge number of storms; it's things like ice storms, these big thunderstorm squall lines that might start at 5 or 6 o'clock in the evening and it's 2 a.m. the next day before they clear out. Those are the kind of things I'm talking about that, on average, are creating 210 million customer minutes of interruption a year over the past 10 years.

So let me give you a contrast of two extremes. If you look at the entire DEP service area, both North and South Carolina – this [indicating] is just the South Carolina number here, but if you just put North and South Carolina together for DEP – just normal weather days, you know, a day like

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today, in a year you get just shy of 200 million customer minutes of interruption. So the point being, a few big storms can have the same impact of customer minutes of interruption that take a whole year to accumulate just under normal circumstances. So it is a big deal, and there are benefits from Power/Forward that can reduce this impact.

Here's the other extreme: Hurricane Matthew. Hurricane Matthew in the DEP area was almost 400 million customer minutes of interruption. So when you think about a Matthew, that was a roughly six-day storm restoration effort. The benefits of Power/Forward is to reduce the number of outage events that happen in these big storms by up to 30 percent. And if you translate that into days of response, if Matthew was a six-day storm, this can take a storm like Matthew down to three or four days, just by taking those events, stopping outages from happening in the first place. And it really helps with the resources, because these storms just really consume resources, which is why it becomes so slow towards the end in restoring power.

And there's other operational benefits that come from this, that's actually in the — we call it the Executive Technical Overview, the white paper.

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I think you have a copy of that. But on page 11, it talks about operational benefits, and you can think of it in terms of truck rolls. So out restoring outages, reducing truck rolls, resource efficiency, just some of the benefits from taking lines out of the exposure of trees, it will show you in the white paper almost $11 million annually of operational benefits just by making these improvements.

[Reference: Presentation Slide 9]

So another benefit that's worthy of note is, I've talked a lot about disruption, and the concern about not acting today. We can be in a situation where disruption will be worsened. And, so, homes and businesses, and disruption being a big concern of ours, we did ask Joseph Von Nessen, with the University of South Carolina, to do an economic impact study. And that economic impact study, which you also have a copy of, looked at not only the impact of the economic investment through Power/Forward but also what is the impact of reliability, of disruption, increasing or reducing disruption, and how does that compare? And that's what we're looking at here is what are the benefits of the reliability improvements from an economic

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perspective.

So if you look at the curve here, of the things I'll point out here, the red curve that you see up there is the impact of a rate increase associated with the cost of Power/Forward. So what we did is we had our Rate Department provide Dr. Von Nessen the numbers to put in his economics to model and put in the economic study: What's the rate impact over a 10-year period? So it starts out at about $84 million in 2018 and it grows to $520 million by the year 2028.

That's a lot of money, and the cost impact is something that's very important for us to manage, and we're concerned about that. But this shows you that rate impact. The other thing I'll point out is, if you look at the green curve and the black curve, what that's showing is the long-run annual benefits for businesses and households by 2018 that's associated with the reliability improvements that will likely range somewhere between $500 million and $724 million.

So the point being, the benefits do outweigh the rate impacts when we looked at what are the benefits of improving reliability from an economic perspective, because of the impact it has on

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people's homes, businesses, and industry.

[Reference: Presentation Slide 10]

And this is a slide that you've seen before, at the last ex parte. So this is a refresher on the job impacts, and the capital investments, they'll support an average of nearly 3300 jobs. And at the peak of Power/Forward, it will expand to 5400 jobs. There's almost $200 million in new salaries and wages that will be generated, on average, with nearly $315 million being generated during the peak construction years. And as we noted in the last ex parte on workforce development, our goal is to recruit the best people and make sure they're well-trained and have the skills that are needed to enable Power/Forward.

[Reference: Presentation Slide 11]

And so Power/Forward, I mean, it's first and foremost about transforming the customer experience, but it will also have a powerful and positive impact on the State's economy. And that's why we had the study done, because we wanted to make that apparent. So the result would be a total economic output of about $5.8 billion in 10 years. And so the $330-or-so million a year, that would rank second among all capital investments

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announcements in South Carolina, according to the Department of Commerce.

Then the other point that's made in the paper is that this investment is roughly equivalent to three automotive manufacturing announcements in the State.

[Reference: Presentation Slide 12]

So now I'm going to shift gears a little bit again, because we talked about benefits. I want to talk more — I think it's really important to dive a little bit deeper and talk about what is in this thing we're calling Power/Forward. What's in it? How are the dollars assigned? What is the flexibility around it?

So what you see here in this slide is there's seven strategic programs. There are layered benefits, so all of these programs contribute in some way to the ultimate benefits that I've been talking about. You can see the way the costs are allocated across the bottom of the blue boxes there. It is a diverse portfolio of investments. It is flexible and adaptable. We can scale up the work, in any one of these things, or scale them down, based on how we are progressing towards the benefits goals. Again, these things are about

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helping customers better manage their energy usage, reducing outage frequency and duration, accelerating storm restoration, protecting against physical and cyber-security, and better managing distributed energy resources. So it's doing the right thing in the right place, to get the right outcome.

Another benefit I'll talk more about in a minute as part of the Power/Forward scope is what we refer to as non-wires alternatives. So a couple slides from now, I'm going to elaborate on that some more.

But I want to give you an analogy, because I think it helps understand the rest of the conversation as it relates to the grid itself. So, I mentioned subsystems a few minutes ago? So the grid has — the distribution part of the grid has three subsystems. We break it down into three subsystems, so we can call it the backbone, the intermediate, and the edge. Backbone, intermediate, and edge.

So the backbone is that part of the grid — that's where the big wire is, it's at the source, and it's mostly in the urban areas and there tends to be more interconnection here. The backbone.

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The intermediate part is what's taking power from the backbone to the neighborhoods, and there's thousands of those lines and circuits that are delivering power from the backbone to the neighborhoods. And then you've got the edge. And these are the lines that go throughout the neighborhoods to deliver power to the customer's meter.

So those are the three subsystems, but a way to think about this is the analogy of a bicycle wheel. So if you think of a bicycle wheel with a hub, spokes, and a rim, the hub is equivalent to the backbone, the spokes are equivalent to the intermediate part of the grid I just described, and then the rim is equivalent to the edge.

The reason I like that analogy is it helps make a point that the grid was engineered and designed for one-way power flow, from the hub out to the rim of the wheel. So that's just, hopefully, a simple way to kind of think about this distribution grid that we have.

So what I'm going to do over the next several slides is, if you look at it, the targeted undergrounding, hardening and resiliency, and self-optimizing grid I'm going to talk about in more

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detail so you can get a feel for what is it we're doing when we talk about these programs and when we say the words "Power/Forward." I'll also talk briefly about smart meters.

But I think a point is, if you go back to the data conversation, the point I made about the data, you know, the data is what we've used to figure out: Don't do the same thing in these different subsystems. Some are not cost-effective to do; they're more cost-effective in a different subsystem. So figuring out what you do where to get the right outcome, to make sure it's cost-effective, is a key part of the whole Power/Forward approach and decision-making process.

[Reference: Presentation Slide 13]

So I'm going to start with targeted undergrounding. So, targeted undergrounding, you know, this is one of the key programs that'll improve storm response and reliability, because it's using the data to identify the most outage-prone overhead lines and move those lines underground. So, when completed, it'll reduce outage events by up to 30 percent. It will also reduce costs and quicken restoration times after major events. And it gets rid of — or reduces or

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gets rid of tree and vegetation work that's needed for these hard-to-access lines. And that's a key part of that.

And these are lines that roughly 15 – that are 15 percent of the overhead miles, is what we're talking about going after here in the edge. This is the edge part of the grid. But they're responsible for 50 percent of all the outages that happen on the overhead system. So the targeted undergrounding in the edge part of the grid, these are lines that go out a lot. Some customers see 20 outages in a year. So this is about stopping outages from happening in the first place, reducing 30 percent of them, and the data is what helps us go find what I refer to as needles in a haystack. So it's hard to find these things, but being able to go to the line segment where the problems are and identify those, that is the key thing that the data brings to the table. So targeted undergrounding on the edge not only will reduce 30 percent of the events, it also improves SAIDI by 10 to 15 percent. So those are the benefits of targeted undergrounding.

Let's talk a little bit about what we're doing. So this is an example of something.

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Hopefully this will start making it real.

[Reference: Presentation Slide 14]

So this is a subdivision in Spartanburg called Quiet Acres. And in Quiet Acres, it's about a quarter-mile line segment – a quarter-mile overhead line segment – that's seen almost 100 outages over the past 10 years. So, on average, 10 outages a year. So, that's a big number. And so you can imagine the numbers of truck rolls associated with going to this quarter-mile segment of line. So this is a good example of where, you know, it takes the surgical data to go find these segments, but if you can find those and take and do things that make outages stop happening in the first place, it has a huge impact.

The important thing to note here, of course, is that this is a very customer-relations-intensive program.

CHAIRMAN WHITFIELD: So it really is quiet acres.

MR. BOBBY SIMPSON [DUKE]: It might get a little noisy.

[Laughter]

It's very customer-intensive. And, you know, so that's – and the reason I want to talk through

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some of these things is we had to take all of this, what I'm about to talk about, into account in terms of the cost. Okay? So it's one thing to do math and get a cost, but to really build in some of the factors that can happen that are controllable, so that you treat the customer right, is a really big part of this.

So before we can move forward with a line segment like this, we have to get updated easements from all the customers. And by the way, in this case, we've gotten all but one of them, and the feedback we're getting has been really positive. Most customers are acting excited about it, because it's the kind of thing where, in these places — you know, if you think of a place that's seen 100 outages over 10 years, well, after a while, that's your normal and you get used to it. So when we bring to the table the opportunity to convert it underground and it's going to make these outages go away in a big way, I mean, it does generate some excitement. There's some hard stuff to work through, because we have to address things like property owners that don't live on-site, so some of them could be rental homes; ownership between siblings with one of the owners living out of town.

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Sometimes we might have to put an underground pad-mounted transformer on Customer A's piece of property so Customer B can be served, and they don't want it on there. We have to work through all of those things. Those are the kind of things that we're working through. But at the end of the day, it all comes back to making outages go away that are high in number and that just really needs to be addressed.

[Reference: Presentation Slide 15]

So that's Quiet Acres. So to give you a feel for what's happening across the State, so this is a table and it's in the Executive Technical Overview, or white paper. So it shows each county and the number of miles. So we're talking about, over a period of 10 years, around 2300 miles of these line segments to convert from overhead to underground, and you see the spread across the counties. But to give you a feel for what's happening right now, in the DEC South Carolina area, we've got work planned in four counties in 2018 and nine counties in 2019, with the majority of the conversions by line miles being in Spartanburg County. In DEP South Carolina, there are three counties in 2018, 11 counties in 2019, with the majority occurring in

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Sumter County in 2018, in Florence County in 2019. So that's your targeted undergrounding.

[Reference: Presentation Slide 16]

I want to move now and talk about — so this is moving from the edge or the rim of the wheel, to the spokes. This is where we do the hardening and resiliency. So to talk about this a little bit, you know, the performance in the intermediate subsystem of the grid, or the spokes of the wheel, is certainly better than what we find on the edge where we're doing this targeted undergrounding, but that doesn't mean work doesn't need to be done. There are programs that we need to invest in that will not only stop outages but they'll reduce the impact when outages do occur. So there's thousands of spokes, and these are our circuits, thousands of these circuits that are carrying power from the backbone or the hub of the wheel, to the edge or the rim of the wheel.

And if you look at the slide here, the table on the left — and we call these hardening and resiliency programs. As I've said already, hardening is stopping outages from happening in the first place; resiliency is minimizing the impact when they do occur. And so there's some programs

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listed here that we're doing, and, you know, one thing that we've found can be confusing is this work that we're talking about here, it is not the left-hand road. So I talked about maintaining by taking a left on the red curve? This is not the left, it's the right. And the reason it's the right is because it's very targeted line-hardening and it's also expediting off of the grid some of these components that are just repeat offenders, in terms of causing outages. There's hundreds of thousands of them out there, and our customary spend investment is just not going to make the problems go away quick enough.

And so I think of this — I use the solid rock or sinking sand analogy. If you really want a solid foundation in terms of your grid, you have to get the spokes right. And this ensures the value of all the other investments in Power/Forward.

So, some specifics: It's raising equipment in flood-prone areas; it includes that. It's the targeted hardening and expediting of these problematic components that I just mentioned. It's also the physical and cyber-security investments, are in this part of the grid.

The other thing I want to mention is what we

call long-duration outage areas. So if you look at the right-hand side of the slide, you'll see some pictures and some places. So these were places — and I just put examples on the slide — where, when we have outages, they tend to be for a long time. I like to use the Town of Aynor to make a point. So the Town of Aynor is somewhere between Florence and Kingstree, that area. And I just always remember when I was in Florence in the early '90s, the mayor of Aynor used to wear me out, because when the power went out, it always took eight to ten hours to get that community back on, because it crossed multiple fields, a lot of it was off-road. And if you go look at Aynor today, not much has changed in terms of the way we serve it, and the time is now because you have rural communities that are more populated. You have business districts where all of this matters. And so this is a case where we look at, is it better to build in an alternative feed, so you've got two sources coming in, so when one goes out, you get it right back on and you go fix the problem? There are some areas where a non-wires alternative might be a better cost-benefit analysis. So, an example would be, instead of building another line in, you might put

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in a micro-grid, batteries and solar. So there's places in the mountains where that makes a lot more sense. Those are the kinds of things that not only are we looking at and doing cost-benefit analyses on, we have dollars in the Power/Forward portfolio to do these things. That's a key part of the Power/Forward plan.

And so the hardening and resiliency piece will reduce or improve SAIDI 10 to 15 percent and it reduced events by 5 to 10 percent. So you can see all of these things in the different subsystems are contributing to the overall 40 to 60 percent SAIDI improvement I mentioned a minute ago.

[Reference: Presentation Slide 17]

So now, if we go to the self-optimizing grid, so this is — sometimes we use the term "smart-thinking grid." So this is where investing in a smart-thinking grid, it will mean fewer outages and faster restorations, so it will build a network. So it's taking that hub-and-spoke one-way power flow and it's creating a mesh, because you're tying circuits together into a network, so that — and you're putting smart devices out there. So it instantly reroutes power when an outage occurs and keeps power on for most customers. So it's

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automated, it's making real-time decisions, it's isolating it.

So the way I like to describe it is, if you can just imagine that when a tree hits a line or a piece of equipment fails or a car hits a pole, so instead of 2000 to 3000 people being out until you fix it, what the smart-thinking grid does when you build it is, you've got the switches out there and you've got the interconnection, so when a car hits a pole, the switch can say, "I saw that. Did you see that?" And they open and close, as needed, so you segment only 300-400 customers that need to be out until you fix it; everybody else comes back on quickly. That's the smart-thinking grid that we're talking about.

And so this is what you do on the backbone. And so, the backbone is something that does not go out much, but when it does, it is a big impact because there's lots of customers on the backbone. It's mostly in the urban areas where you're coming out of these big substations. So this would improve SAIDI by 30 to 40 percent. This is the biggest contributor to the SAIDI improvement. It doesn't stop outages; it deals with them instantly when they happen.

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[Reference: Presentation Slide 18]

And so, just to give you a feel for what that looks like, so, what you're looking at here, there's two substations in the Greenville area. One of them is called Oneal and one of them is called Pebble Creek. So, Oneal serves about 1300 customers, Pebble Creek serves about 800. Well, these substations, they're not tied together, and if you look at the pictures, it's what I think is a black box at the top – that little black-box symbol – is the substation. And, currently, they're not tied together. So smart-thinking grid involves what I call capacity, connectivity, and control; I call them the three Cs. Capacity, at capacity, so you can back up each other. Connectivity, connect substations together. And put in automation to control it.

So if you look at this picture here, the blue line represents the fact that we're building a line to tie Pebble Creek Substation to Oneal Substation. So there comes your connectivity, and you put in the capacity so they can back up each other. Then the red and green boxes are the switches that we're putting in place that talk to each other, like I just described.

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So what happens when you do this, you've got the smart-thinking grid in this Pebble Creek/Oneal area in Greenville, so when you have an outage, instead of somewhere between 800 and 1300 customers being out, it's more like 300-500. But I really want to make this point: On many of our substations when this happens, it can be 2000-3000 people out. You know, this is a smaller number of customers on these substations. So, a lot of them, it's 2000-3000, so you're going from 2000-3000 to 300-400. So that's what the smart-thinking grid does.

[Reference: Presentation Slide 19]

And to show you what we're doing here — this is also in the white paper. But it's really about tying the circuits so that you have no more than several hundred customers between these switches. So about 50 percent of the circuits in South Carolina — it's about 50 percent of the circuits serve about 80 percent of the customers in the State, so they'll be upgraded to these new guidelines. And to be more specific, in the DEP area, there's 81 projects in 2018 to start doing this work, 78 in 2019. The top three areas are Greenville, Spartanburg, and Anderson Counties, but there's also work planned in Chester, Greenwood,

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Lancaster, Oconee, Pickens, and York Counties. Then in the DEP area, there are 38 projects in 2019. So we won't move into DEP until 2019. The top three areas, though, are Florence, Sumter, and Darlington Counties, but also projects planned in Chesterfield, Clarendon, Dillon, Kershaw, Lee, and Marlboro Counties.

This will give you a feel for what's really happening out there in terms of the real work that's behind, you know, the philosophy and vision that we talked about here with Power/Forward.

[Reference: Presentation Slide 20]

So now I'm going to move to my next-to-the-last slide. This is about smart meters. And I think we all know that customers want more when it comes to their interaction with the utility. So the smart meter work that we're doing, you know, I mean, if you get down to the bottom line of "Why do smart meters," I mean, it certainly helps us in terms of operational efficiency, because you don't have to go read the meter, you don't have to drive by the meter, and you can ping it to see if the power's on or off, and that's a huge benefit when it comes to restoration. But from a customer standpoint, it's about bill accuracy, no estimated

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bills. From a customer experience standpoint, you're talking about equipping them to make informed decisions, no surprises, more interaction and control over saving money in terms of what they do behaviorally that costs them money. And there's features and programs that a lot of people like, like pick your own due date, prepay, and those types of things. So the smart meter's definitely a key part of Power/Forward Carolinas.

[Reference: Presentation Slide 21]

So on my last slide here, I just real quickly will wrap this up to say, what are we solving with Power/Forward Carolinas? And it's these things that I've already talked about. We're seeing an emergence of what I call a new normal, in terms of a high probability of a worsening reliability trend, as much as 35 to 50 percent over a 10-year period, with a resulting growth in consumer disruption, if that happens, which affects homes, businesses, and industry in this State. And you couple that with the growing reliance on power in a 21st-century digitized society. So that's number one.

Number two, this is a grid that needs to be re-engineered to support renewables, because good

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utility practice is enabling renewables, but don't compromise reliability.

Number three, the physical and cyber-attacks. We've got to be vigilant about this, because the attacks, they're advanced and they're persistent. And the Department of Homeland Security, in June 2017, essentially put the energy sector, which is the utilities in this country, on notice about all of this because of what they were seeing.

And then number four, just the changing customer expectations, so it's the collective wants and needs of customers with things like smart meters addressed.

So the left-hand side of the road: maintain. It's really an outdated grid that we need to transform. It's well-maintained but it's becoming outdated. So we've got to also go down the right-hand road and transform it, so that it is more flexible and accessible; it is harder and more resilient; and it is secure; and it is smart-thinking. And the key point is, we see the evidence, we have time to change, and we need to act now and do it over a reasonable period of time.

So a simple way to sum it up is, we feel like we've got a plan that, over the next decade, we can

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invest in our energy structure in a way that we believe will power South Carolina into a future that may look different than it does today, but it will position the State for great success, meet customer expectations, and drive economic development. And as we discussed in the last ex parte on workforce development, it will increase the need for skilled labor in South Carolina, and we're working closely with our utility partners to address the workforce needs.

So that concludes my presentation. I'll be glad to take questions. Thanks for listening.

CHAIRMAN WHITFIELD: Thank you, Mr. Simpson.

Commissioners, questions for Mr. Simpson? Commissioner Randall.

VICE CHAIRMAN RANDALL: Thank you, Mr. Chairman.

Mr. Simpson, welcome back again.

MR. BOBBY SIMPSON [DUKE]: Thank you.

VICE CHAIRMAN RANDALL: That was – a couple of things I'm just interested in. I know the last time, I asked about underground lines. I know Cojo was getting on me about that. I see your total miles of your underground lines. What's your average? I know the average length – is it just

depending on what's going on in that area, that you're doing an underground?

MR. BOBBY SIMPSON [DUKE]: The average length of what we convert?

VICE CHAIRMAN RANDALL: Uh-huh?

MR. BOBBY SIMPSON [DUKE]: You know, I don't know that exactly, but it –

VICE CHAIRMAN RANDALL: Just done according to need in that particular area?

MR. BOBBY SIMPSON [DUKE]: Yeah, it can range from short segments, like 1000 feet, to several miles, because it's anything from a segment of line with a few homes, but it's just causing a huge number of outages that affect the whole rim –

VICE CHAIRMAN RANDALL: Yeah?

MR. BOBBY SIMPSON [DUKE]: – or it can be major subdivision developments. And we're purposely starting small, because of the things we want to learn the right way and not trip over ourselves, because of all the customer things that we want to make sure we understand and do right.

VICE CHAIRMAN RANDALL: I was – only other thing I wanted to ask you about, I was – when you were talking about spots where you're trying to connect, reconnect, go around certain situations in

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your spots like in the mountains or other areas where you're talking micro-grid with batteries and solar, how reliable — I mean, are batteries getting more reliable and cost-effective now, to be able to do a micro-grid like that?

MR. BOBBY SIMPSON [DUKE]: They are. They are. And I can't quote specific numbers, but I can tell you we've got 25 to 30 people in our company that are focusing on non-wires things, which includes batteries. And so I talk to them periodically. The price points are definitely coming down. We've got cases that we're doing it right now where the cost-benefit proves out. Because usually with batteries, you get into what we call stacked benefits, so it helps the reliability thing but it's also something you can use in peak to relieve the grid. So that's like two benefits, instead of one.

VICE CHAIRMAN RANDALL: Thank you, sir.

MR. BOBBY SIMPSON [DUKE]: You're welcome.

VICE CHAIRMAN RANDALL: Thank you, Mr. Chairman.

CHAIRMAN WHITFIELD: Thank you, Commissioner Randall.

Commissioner Howard.

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COMMISSIONER HOWARD: Mr. Simpson, I enjoyed your presentation.

MR. BOBBY SIMPSON [DUKE]: Thank you.

COMMISSIONER HOWARD: When we're talking about modernizing the grid or grid improvement – whatever term you want to use – in your mind, what percentage of that is transmission versus distribution lines?

MR. BOBBY SIMPSON [DUKE]: As far as the overall investment?

COMMISSIONER HOWARD: Any way you want to put it. You can use the 10-year plan, your seven icons up there.

MR. BOBBY SIMPSON [DUKE]: Most of the investment is in the distribution grid.

COMMISSIONER HOWARD: Can you put a percentage on it?

MR. BOBBY SIMPSON [DUKE]: It's roughly 70-ish percent. All those programs, and I talked about the subsystems, they represent about 70 percent of the investment. Transmission is just shy of 20 percent.

COMMISSIONER HOWARD: Well, I agree with you that technology is changing the whole landscape, and I'm going from years ago. But do you have a

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cost per mile for underground versus overhead? And I know there's a lot of variables in underground going under pavements, going open area, and new development, and this kind of thing. Is there any kind of average cost you've got for underground versus overhead today, versus, what, 10 years ago, five years ago?

MR. BOBBY SIMPSON [DUKE]: We do have those numbers. I can't quote them at the moment, but I can tell you that the cost – it used to be that overhead was always cheaper, and that's not the case anymore. It gets into the failure rate and the number of outages which goes into the cost equation. So the answer now is: It depends, and you have to look at each one on a case-by-case basis.

But I will say that the most cost-effective place to do the undergrounding is this place I call the edge or the rim of the wheel, because those are areas where they're causing a lot of outages but they're also the least cost because they're not in these major developed areas with concrete and other things that add to the cost, if that makes sense.

COMMISSIONER HOWARD: Yeah. We've always heard, and if it's still the case – is it still the

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case that there's this big disadvantage of underground is it's so difficult to repair — locate and repair? Is that technology changing that statement any?

MR. BOBBY SIMPSON [DUKE]: Technology has changed it. The technology to find the problem, I mean, it used to — the old technology, you had to risk damaging the cable — we called it thumping — to find it, and it was hard to find. Today there's radar type technology so you can home in on exactly where it is and not damage the cable, and find it faster. So there's clearly advancements that have been made in terms of finding problems. Plus, the cable failure rate, the quality of the underground cable today is just orders of magnitude better than the original underground cable. It's a better quality, lasts longer, and it's easy to find, compared to the old days.

COMMISSIONER HOWARD: You had a portion of your presentation on Quiet Acres — is it? — in Spartanburg?

MR. BOBBY SIMPSON [DUKE]: Yes.

COMMISSIONER HOWARD: The cost of that, who bears the cost of that?

MR. BOBBY SIMPSON [DUKE]: We do.

VICE CHAIRMAN RANDALL: The whole – it is in the rates? It goes in the rates, right? Do you put that in the rates?

MR. BOBBY SIMPSON [DUKE]: It would.

COMMISSIONER HOWARD: So all Duke ratepayers would pay for the cost of Quiet Acres; is that right?

MR. BOBBY SIMPSON [DUKE]: Yeah, the cost of Power/Forward, the intent would be to recover the cost through rates, yes, but the targeted undergrounding is not something that on a case-by-case we're charging those customers for that work.

COMMISSIONER HOWARD: Explain that again, case by case you're –

MR. BOBBY SIMPSON [DUKE]: We're not charging customers for the targeted undergrounding.

COMMISSIONER HOWARD: I know, you know –

MR. BOBBY SIMPSON [DUKE]: It will pass through rates.

COMMISSIONER HOWARD: – every urban area, just about, you know, particular members of the General Assembly wants this particular area's cable underground and this kind of stuff. And the general comeback is, "Okay, if your neighborhood pays for it, we can do it," but the cost is so

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exorbitant that they don't go there. Is that still a problem with you, as —

MR. BOBBY SIMPSON [DUKE]: Well, those are cases where it's usually wanted for aesthetic reasons?

COMMISSIONER HOWARD: Correct.

MR. BOBBY SIMPSON [DUKE]: So nothing changes there, because Power/Forward targeted undergrounding is strictly reliability/performance-based. It's got to reduce outages, and it's got to meet a certain criteria.

COMMISSIONER HOWARD: I don't know if there's a definite answer to this, but when you go underground, how deep do you put the wires? And my mindset is gas lines; I mean, you always have, you know, a contractor or something breaking gas lines. In a situation like this, how deep are the lines buried in relationship to a gas line?

MR. BOBBY SIMPSON [DUKE]: They're deeper. So the power line has to be at least three feet deep — a power line with high voltage. Gas lines are something less than that — I can't remember the exact number. But I do know we're the deepest in terms of what the code requires.

COMMISSIONER HOWARD: I have to admit I have

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not read your white paper. I looked over it and I'm looking forward to reading it. But thank you for your presentation.

MR. BOBBY SIMPSON [DUKE]: Thank you, sir.

CHAIRMAN WHITFIELD: Thank you, Commissioner Howard, for your questions.

Commissioner Hamilton.

COMMISSIONER HAMILTON: Thank you, Mr. Chairman.

Mr. Simpson, I've enjoyed your presentation. I just wondered if they'd asked you to make this 20 years ago, what it would've been like? Or 10 years ago? It wouldn't resemble what we've heard today, would it?

MR. BOBBY SIMPSON [DUKE]: Yes, sir, that's an interesting thing for me to think about, though.

CHAIRMAN WHITFIELD: Commissioner Hamilton, can you pull that mic –

COMMISSIONER HAMILTON: Okay [indicating].

CHAIRMAN WHITFIELD: – a little closer?

COMMISSIONER HAMILTON: I don't ever do that right, do I?

Mr. Simpson, to follow up on what Commissioner Howard was talking to you about, Quiet Acres, how much of this is a pushback from the residents for

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vegetation control?

MR. BOBBY SIMPSON [DUKE]: So, your question is how much is –

COMMISSIONER HAMILTON: How much is –

MR. BOBBY SIMPSON [DUKE]: – concern about –

COMMISSIONER HAMILTON: – pushback – the reason that you're having the number of outages is because of the pushback from residents to allow vegetation control in a subdivision?

MR. BOBBY SIMPSON [DUKE]: So what we have found with these lines is it's not because the right-of-way is not being trimmed on cycle; it's because of trees outside of the right-of-way. That's most of the reason. You can keep it trimmed, stay on point with your maintenance cycle, but the foliage is so dense that trees outside of our authorized right-of-way, things fall and take it out. That's a lot of the reason these are a problem. Did I answer your question?

COMMISSIONER HAMILTON: I think we're getting close to it, anyway. Let me ask you, most of the lines that you're doing in areas like Quiet Acres are trunk lines and not residential distributive lines?

MR. BOBBY SIMPSON [DUKE]: They're – well,

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they're primary lines, so they're high-voltage lines.

COMMISSIONER HAMILTON: Right.

MR. BOBBY SIMPSON [DUKE]: But they're the smaller wire that's –

COMMISSIONER HAMILTON: Yeah.

MR. BOBBY SIMPSON [DUKE]: – taking it to local smaller groups of people.

COMMISSIONER HAMILTON: Yeah. The smaller lines, you aren't putting underground, are you?

MR. BOBBY SIMPSON [DUKE]: Well, these are some – well, if you're talking about lines that go from the transformer to the house?

COMMISSIONER HAMILTON: Yes, sir.

MR. BOBBY SIMPSON [DUKE]: If that's what you're asking, those would be put underground, also, if it makes sense, because – and it's going to almost always make sense. The reason it wouldn't make sense is if there's some reason the customer doesn't want it that way, or there's a big sacred tree in the way and they don't want us digging in the yard for some reason. But the intent is to put the services underground, as well, and have the whole thing turnkey underground. There will be cases where you'll have a pole still

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sitting there because the customer doesn't want their service to the house underground.

COMMISSIONER HAMILTON: That would be unusual, wouldn't it?

MR. BOBBY SIMPSON [DUKE]: I think it would, but it's early.

[Laughter]

COMMISSIONER HAMILTON: Let me look, if you would, look at the slide on the Statewide benefits and help me understand it. We had earlier said this would be a cost to the ratepayer.

MR. BOBBY SIMPSON [DUKE]: This slide [indicating]?

[Reference: Presentation Slide 9]

COMMISSIONER HAMILTON: Yes, sir.

MR. BOBBY SIMPSON [DUKE]: Okay.

COMMISSIONER HAMILTON: All right. I think the customer cost is the red line, which over the next, what, ten years, eight to ten years —

MR. BOBBY SIMPSON [DUKE]: Yes, sir.

COMMISSIONER HAMILTON: — is going to bring an increase to the customer of approximately $300, somewhere in that neighborhood?

MR. BOBBY SIMPSON [DUKE]: I'm not sure about the $300.

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COMMISSIONER HAMILTON: I was just looking at your — I was trying to read your scale.

MR. BOBBY SIMPSON [DUKE]: Right.

COMMISSIONER HAMILTON: And I might not be — I might not be —

MR. BOBBY SIMPSON [DUKE]: That is —

COMMISSIONER HAMILTON: Help me interpret it. If I'm making a mistake, I'd like to be sure.

MR. BOBBY SIMPSON [DUKE]: Well, there's actually something not on the slide that should be. It's in millions.

COMMISSIONER HAMILTON: Okay.

MR. BOBBY SIMPSON [DUKE]: It's in millions, so that's not even on there, I'm noticing.

COMMISSIONER HAMILTON: Okay, well, thank you. That helps me. But the customer benefits are a slim line between that, on this chart, and the customer. But on Statewide Benefits, it increases substantially till all of a sudden it takes a trip right. Am I reading this right when I see the blue line, the Statewide Benefits, drop as dramatically as it does?

MR. BOBBY SIMPSON [DUKE]: Yeah, so let — let me take some time to explain that. So, the blue line is the economic benefits from the investment

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itself.

COMMISSIONER HAMILTON: Right.

MR. BOBBY SIMPSON [DUKE]: Right? And the reason it drops like it does from 2026 to 2028 is because the investment would end. So Power/Forward is a 10-year program, so at the end of 10 years, it would tail down. So what it's generating to the economy stops when the program is finished. That's what that blue line is representing.

COMMISSIONER HAMILTON: It would appear that the benefits would continue, even though the project was completed – but maybe I just don't understand.

MR. BOBBY SIMPSON [DUKE]: So maybe you're asking about that little blue segment on the very end?

COMMISSIONER HAMILTON: I'm talking about the top line that goes on the Statewide Benefits, which is the top line that you're talking about, and you see how it almost takes a dive?

MR. BOBBY SIMPSON [DUKE]: Yes. Yes. The reason it takes a dive is because we finish the program and we're not spending money building it anymore. So those things the economist look at, like gross-domestic-product impact and all that,

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we're not contributing to that from the Power/Forward investment anymore, because the investment is ended.

VICE CHAIRMAN RANDALL: Okay. All right. Thank you, sir. I appreciate your explanation.

MR. BOBBY SIMPSON [DUKE]: Thank you.

CHAIRMAN WHITFIELD: Thank you, Commissioner Hamilton.

Commissioner Fleming.

COMMISSIONER FLEMING: Good morning.

MR. BOBBY SIMPSON [DUKE]: Good morning.

COMMISSIONER FLEMING: Thank you for bringing this back today and giving a more detailed explanation of what Power/Forward is all about. I think we all got a little distracted by — we were so interested in it that we kind of gave workforce development kind of a little lower rating last time, so I appreciate your coming back.

MR. BOBBY SIMPSON [DUKE]: It's my pleasure. Thanks for listening.

COMMISSIONER FLEMING: Yeah, it — this sounds very like — it's very exciting, actually, to hear your plans for what the future will be for Duke Energy Carolinas and Progress.

I wanted to ask you — I wanted to ask about

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the economic benefits, as well –

MR. BOBBY SIMPSON [DUKE]: Okay.

COMMISSIONER FLEMING: – on page 10.

MR. BOBBY SIMPSON [DUKE]: [Indicating.]

[Reference: Presentation Slide 10]

COMMISSIONER FLEMING: And when you said that approximately 3300 jobs would be created for the State – so are you – I was wanting to know in what capacity those jobs would be created, but are you saying they're only going to be created with the construction of the Power/Forward?

MR. BOBBY SIMPSON [DUKE]: Yes, those are associated with doing the work, the construction.

COMMISSIONER FLEMING: Okay. So those jobs would – so it won't have that kind of benefit long-term; it will just be for the 10 years.

MR. BOBBY SIMPSON [DUKE]: That's correct. What this is showing is the impact of the investment.

COMMISSIONER FLEMING: Okay.

MR. BOBBY SIMPSON [DUKE]: Doing the work creates those jobs.

COMMISSIONER FLEMING: Okay. So the $200 million in new salaries will only be for the 10-year period.

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MR. BOBBY SIMPSON [DUKE]: Right, that's what they apply to, although we believe that when the work is finished, just the fact that the grid is different, I mean, I think it will – I think it will – continue to generate job opportunities.

COMMISSIONER FLEMING: Well, that was my next question. With all of the improvements to the grid and with that workforce being here, you would think that – so you don't have any statistics, though, of what that looks like?

MR. BOBBY SIMPSON [DUKE]: I do not. But it will take a workforce to operate and maintain it.

COMMISSIONER FLEMING: Okay.

MR. BOBBY SIMPSON [DUKE]: I think that's going to have a positive impact on jobs.

COMMISSIONER FLEMING: And could you talk a little bit more about the non-wires that you had mentioned earlier, exactly where you see that going? You know, you hear a lot about that. And in addition to the micro-grid, that also includes energy efficiency and demand-side management, doesn't it?

MR. BOBBY SIMPSON [DUKE]: Yes, it does. It does.

COMMISSIONER FLEMING: Okay. Could you talk a

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little bit more in depth about –

MR. BOBBY SIMPSON [DUKE]: The non-wires?

COMMISSIONER FLEMING: Yes.

MR. BOBBY SIMPSON [DUKE]: Sure.

COMMISSIONER FLEMING: How you see that moving forward, and what percentage of, I guess, improvement you would see.

MR. BOBBY SIMPSON [DUKE]: Okay. So tell me if this addresses your question. So, I'll start with, you know, I talked about the smart-thinking grid and self-optimizing. And you may remember I mentioned that roughly 50 percent of the circuits, once you connect them together, about 80 percent of the customers are on that grid? Well, the further you go from these urban centers and get in more rural areas, it may not be cost-effective to do the full smart-thinking grid; it may be more cost-effective just to build alternative feeds into these rural communities. And I always like to characterize the rural communities as just because they're rural doesn't mean there's not a significant size of people and business districts that matter, and so we want to make sure that they're seeing the same reliability. So in these rural areas where we're building alternate feeds,

it may be more cost-effective to put in, beside a substation, a battery and a solar farm, so that that's your backup, so that their backup is not the grid; the backup is off the grid. So, I mean, that's the specific example. And there are cases where we've already done it somewhere in the Duke Energy system or we're doing it. And there's others under evaluation.

COMMISSIONER FLEMING: And that's – from what I've understood, that's less expensive than actually putting the transmission line in, to carry the power there. Correct?

MR. BOBBY SIMPSON [DUKE]: If it's transmission, I would –

COMMISSIONER FLEMING: Or distributed energy. The grid, whether it be distributed or transmission, I guess.

MR. BOBBY SIMPSON [DUKE]: Right. Well, if it's transmission, I would conjecture that there's a higher probability it may be more cost-effective to do something non-wires.

COMMISSIONER FLEMING: Like the micro-grid in that situation?

MR. BOBBY SIMPSON [DUKE]: Right. But we look at those on a case-by-case basis. So there's a

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very comprehensive financial analysis done on each one.

COMMISSIONER FLEMING: Okay. And the energy efficiency and demand-side management would bring relief to the customer, as well, if they take advantage of that?

MR. BOBBY SIMPSON [DUKE]: If they take advantage, yes.

COMMISSIONER FLEMING: Have you looked at areas that already have this smart-thinking grid in place?

MR. BOBBY SIMPSON [DUKE]: As far as other utilities?

COMMISSIONER FLEMING: Yes.

MR. BOBBY SIMPSON [DUKE]: We do.

COMMISSIONER FLEMING: To kind of build on what their best –

MR. BOBBY SIMPSON [DUKE]: Yes.

COMMISSIONER FLEMING: – what the best practices are?

MR. BOBBY SIMPSON [DUKE]: Yes, we do.

COMMISSIONER FLEMING: Could you talk a little bit about some of those areas?

MR. BOBBY SIMPSON [DUKE]: We've talked with Florida Power & Light, in terms of – they call them

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self-healing teams?

COMMISSIONER FLEMING: Uh-huh?

MR. BOBBY SIMPSON [DUKE]: But it's essentially the predecessor of the smart-thinking grid I describe. So they're doing this; we've talked to them about it, compared notes on that. The targeted undergrounding, we've been talking with Dominion, because they've got about a three-year lead on us in Virginia doing that work. Georgia Power is another company that we've talked with. And we're doing — we're not finished with it yet; we're doing a lot of research on what other utilities around the country are doing. What we're finding is virtually every utility is doing things that look the same, and when you start peeling the onion to understand it better, there are some differences, because there's differences on their system. But I would just say, in general terms, modernizing and transforming the grid along the way I'm talking about, everybody is moving in that direction to some degree. It's just how quick and how much the investment is, is the only big difference.

COMMISSIONER FLEMING: So you are looking at — this is not like it's experimental. You know that

it works. You're building on the best practices of other areas.

MR. BOBBY SIMPSON [DUKE]: Definitely. We know that it works.

COMMISSIONER FLEMING: And with renewables – I think I asked you this last time, and you kind of went around it. But with the interconnection challenges that are happening, especially in North Carolina, this – it sounds like this is one of the things that can remedy what those challenges are.

MR. BOBBY SIMPSON [DUKE]: Yes. And please don't let me go around it again.

COMMISSIONER FLEMING: Okay.

MR. BOBBY SIMPSON [DUKE]: Because I want to –

COMMISSIONER FLEMING: Well, you said it was political, last time.

MR. BOBBY SIMPSON [DUKE]: I think I remember doing that.

[Laughter]

So I want to make sure I'm clear. So the investment is about – I've used the words "one-way power flow" and "two-way power flow." So if you think of the overall grid, it was not engineered and designed for two-way power flow. So when you start putting these renewables on here, they

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introduce two-way power flow. And it works for a while, but as it starts getting more dense, especially in some of these rural areas, it starts creating reliability issues. That doesn't change the fact that, when a solar developer wants to put solar on the grid somewhere, you've still got to study it, because you need to know what is that particular installation going to do to the grid in that place, so you can remedy that and make sure it's ready. I mean, a simple way to think about it is, you may have the highways that enable growth in a big area, but if you put a big condominium development in a neighborhood, that kind of messes everybody up; you've got to look at the local roadway impacts. It's that kind of thing that we still have to be diligent with the interconnection studies, but the bigger picture is just the overall grid getting that two-way power flow capability so it's designed for something that didn't even exist when it was designed.

COMMISSIONER FLEMING: So this enables that to move forward.

MR. BOBBY SIMPSON [DUKE]: Yes. Yes, ma'am.

COMMISSIONER FLEMING: And in a successful way. And let me ask you, have you taken advantage

of some of the national labs? I know I've been involved with a group that works some with national labs, and they have so many resources out there, especially I know the national lab outside of Denver, NREL, I think deals directly mostly with renewables. Are you all taking advantage of that resource?

MR. BOBBY SIMPSON [DUKE]: I have read papers from NREL that have come into the company. We have a group of 25 to 30 people that are – they get up and come to work every day about non-wires things, and I know they are connected with those types of laboratory things. I just can't speak to any specifics.

COMMISSIONER FLEMING: Okay. I was just wondering if Duke is taking advantage of that opportunity, as well, as you're looking into this development.

MR. BOBBY SIMPSON [DUKE]: Yeah.

COMMISSIONER FLEMING: It looks – it's just a very positive thing for South Carolina – South Carolina and North Carolina. Thank you, very much, for your presentation.

MR. BOBBY SIMPSON [DUKE]: Thank you.

CHAIRMAN WHITFIELD: Thank you, Commissioner

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Fleming.

Commissioner Elam.

COMMISSIONER ELAM: Good morning.

MR. BOBBY SIMPSON [DUKE]: Good morning.

COMMISSIONER ELAM: I know that Mr. Ellerbe would be really disappointed if I let a hearing go by without trying to throw in a telecom reference, so, there's a concept out there right now with broadband installation that talks about digging once. When you are relocating lines from poles to underground, is there any effort – I mean, there may be other wires on your poles, distributionwise.

MR. BOBBY SIMPSON [DUKE]: Yes.

COMMISSIONER ELAM: Are you trying to work with telecom companies, or whoever, to try to, in essence, dig once and get the whole area at the same time?

MR. BOBBY SIMPSON [DUKE]: Yes. Yes, sir, we are. We're working with cable and phone companies, because it's the dig-once thing but it's also get the pole out of there.

COMMISSIONER ELAM: Right.

MR. BOBBY SIMPSON [DUKE]: So that's – it's definitely one of the challenges. There will be cases where they're not going to come off quick

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enough, if at all. And in that case, we would — they'd have to buy the pole from us and maintain it, and the pole would still be there. And at first, that was a worry of mine, but at the end of the day, the customer, the way they're looking at it is the Quiet Acres thing? So you're talking about taking — their lights aren't going to go out that often anymore? I mean, they're ready to sign up and let the pole remain.

COMMISSIONER ELAM: Do your —

MR. BOBBY SIMPSON [DUKE]: We are coordinating with them, is the point.

COMMISSIONER ELAM: Okay. Do your cost estimates reflect somehow that there is that opportunity for cost-sharing of the expense, the cost, of digging? Or are you just — do you know how you're handling that?

MR. BOBBY SIMPSON [DUKE]: I know that it's handled through joint-use contracts that we have, and I'm not familiar with the details of those contracts. But there are people that their job is to make sure that there is cost-sharing when appropriate.

COMMISSIONER ELAM: Okay. Thank you.

MR. BOBBY SIMPSON [DUKE]: You're welcome.

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CHAIRMAN WHITFIELD: Thank you, Commissioner Elam.

Hold on one second.

[Brief pause]

CHAIRMAN WHITFIELD: Commissioner Bockman.

COMMISSIONER BOCKMAN: Good morning, Mr. Simpson.

MR. BOBBY SIMPSON [DUKE]: Good morning.

COMMISSIONER BOCKMAN: Thank you, so much, for your informative presentation. I just have a question or two, related to your Slide 8, which talked about reducing major storm impacts?

MR. BOBBY SIMPSON [DUKE]: This one [indicating]?

[Reference: Presentation Slide 8]

COMMISSIONER BOCKMAN: Yes.

MR. BOBBY SIMPSON [DUKE]: Yes.

COMMISSIONER BOCKMAN: What criteria applies to make an overhead tap line so vulnerable that it becomes a candidate for undergrounding? I mean, how do you determine what line to put underground?

MR. BOBBY SIMPSON [DUKE]: We look at the number of outages it's experienced over the past 10 years. So it has to exceed a certain threshold of events per mile over the past 10 years.

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COMMISSIONER BOCKMAN: And that was my question. What's the threshold? If a certain number of events is the threshold, what would that be?

MR. BOBBY SIMPSON [DUKE]: The number – so, it's 20. Well, it's somewhere between 10 and 20. So we've got events per mile. Bhe worst case, they start at 20 events per mile.

COMMISSIONER BOCKMAN: Over the 10-year period.

MR. BOBBY SIMPSON [DUKE]: Over the 10-year period. And as you work down the list, you're getting lower and lower events per mile, and so we've got the flexibility to stop. You know, it's not something for perpetuity. You know, we may stop shorter than going, you know, below the number 10 – I'm just making that up, to make a point.

COMMISSIONER BOCKMAN: Thank you, Mr. Simpson.

Mr. Chairman, that's all I have for Mr. Simpson. Thank you.

CHAIRMAN WHITFIELD: Thank you, Commissioner Bockman.

Commissioner Randall, I think, has another question for you.

VICE CHAIRMAN RANDALL: Just one quick one,

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going back to the micro-grid and battery thing. When those are designed, will they be – when you've got an outage, will they be able to provide 100 percent of the power for – I'm sure you're still looking at this, but for how long would that work? You know, is it a few hours or for a day or for a week?

MR. BOBBY SIMPSON [DUKE]: Well, that's the key criteria. So if you just take – I'll just take the Town of Aynor, to make a point. I don't know that we would do one there. But we would look at history; so when outages happen in Aynor, if they typically take eight to ten hours, the battery's got to last longer. The battery can't run out while we're repairing it. So that's a key decision-making criteria that we do on a case-by-case basis.

VICE CHAIRMAN RANDALL: Okay. Thank you. Thank you.

CHAIRMAN WHITFIELD: Thank you, Commissioner Randall.

Commissioner Fleming, I think, had another one for you, also.

COMMISSIONER FLEMING: Yeah. I meant to ask – I know the cost of the grid is something to be

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considered, but at the same time, have you done studies of what the economic benefit to a community is, to not lose their power or to have it turned on quickly? And what really makes me think about that, when I was on City Council, during the holiday season one year, lights were out for about two weeks. I mean, all of the – the country club, all of the restaurants, the venues were just in a panic because they were losing – that was a big moneymaker for them. So I would think that, even though you may have a certain dollar figure, that could be counterbalanced with the economic benefit to the community in not losing power. And so have you done studies that can give you those kind of figures?

MR. BOBBY SIMPSON [DUKE]: Yeah, and that's contained in Dr. Von Nessen's report. So when you look into the report, you'll see it quotes – I happen to remember this number, I've had to look at it so much – $334 million is the current losses, and this is Statewide in terms of our system. $334 million a year is what residents, business, industry lose. And so the point is made that it could double in 10 years, given the reliability worsening that we project. Then the graph that I

showed showed the range of around $500-$700 million benefit by improving the reliability. It doesn't take it below the State level, though.

COMMISSIONER FLEMING: So that would be on a yearly basis.

MR. BOBBY SIMPSON [DUKE]: Yes, ma'am.

COMMISSIONER FLEMING: Okay. Thank you. Oh, and one other thing. Have you looked at what putting distributed energy resources will do? There have been some studies in some places, done, that it actually helps with the resiliency of the grid. Have you all done any studies on the benefits of those to the grid?

MR. BOBBY SIMPSON [DUKE]: As far as, you mean, like solar?

COMMISSIONER FLEMING: Yeah. Yeah. Any of the – yes, like solar, like any of the distributed energy resources. So that's just something you're not prepared to talk about.

MR. BOBBY SIMPSON [DUKE]: Well, the way I look at resiliency is you reduce impact on customers when an outage happens. So the micro-grids provide a way to backstand an area that's not – so it wouldn't be on the grid; it's backstood by a micro-grid. And that, to me, is improving

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resiliency because it's reducing impact when an outage happens, because you get them back on faster instead of them having to wait until we fix it.

COMMISSIONER FLEMING: Okay. All right. Thank you.

MR. BOBBY SIMPSON [DUKE]: Thank you.

CHAIRMAN WHITFIELD: Thank you, Commissioner Fleming.

Mr. Simpson, you've had a good presentation. You've been awful patient, but we do have a couple more questions for you.

MR. BOBBY SIMPSON [DUKE]: Sure.

CHAIRMAN WHITFIELD: And hopefully, I think that's going to about wrap it up. So, first, our attorney, Mr. Melchers, has a question for you.

MR. BOBBY SIMPSON [DUKE]: Okay.

MR. MELCHERS: Thank you, Mr. Chairman.

Quick question: You mentioned several times that the advent of two-way flow creates resiliency and reliability issues. Why?

MR. BOBBY SIMPSON [DUKE]: The lack of two-way flow.

MR. MELCHERS: But your system is designed for one-way —

MR. BOBBY SIMPSON [DUKE]: Correct.

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MR. MELCHERS: — and you talked about how distributed generation has created changes in the way the system is being used. What is it about the design of the system that that change stresses it?

MR. BOBBY SIMPSON [DUKE]: Yeah, great question. So here's what goes on. So if you think of that hub-and-spoke analogy, in general, the way the grid was designed and built is wire gets smaller the further away you get from the source, and the locations that most of this solar is being put — so far, today — is out in rural areas where the wire is small. So you end up with small wire that can't handle the intermittency that comes with the solar, so you get a lot of voltage flicker; it makes voltage regulators operate a lot. You also have cases where, because it gets put in rural areas, you can have a large concentration of solar out in a rural area, and it actually makes — creates more losses rather than improving losses, because essentially you're making the distribution grid something that's hauling power, and it wasn't designed to transmit power back and forth; it was really one-way to get it to the meter. Does that help?

MR. MELCHERS: Thanks. Appreciate it.

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CHAIRMAN WHITFIELD: Is that it?

MR. MELCHERS: Yeah.

CHAIRMAN WHITFIELD: Thank you, Mr. Melchers.

Mr. Simpson, I've got just a couple for you and I think this is going to wrap it up. If you could – and I'm going to ask you maybe to turn to some slides as I ask these.

MR. BOBBY SIMPSON [DUKE]: Sure.

CHAIRMAN WHITFIELD: – first of all, if you could go to, I think it's page nine, that slide where Commissioner Hamilton was asking you a question about that particular graph there and the blue line. I don't want to speak for him, but he seemed a little bit still confused when he finished asking his question. And if he's not, I am. So I want to ask you –

MR. BOBBY SIMPSON [DUKE]: Okay [indicating].

[Reference: Presentation Slide 9]

CHAIRMAN WHITFIELD: – about the blue line.

MR. BOBBY SIMPSON [DUKE]: Okay.

CHAIRMAN WHITFIELD: Where that peak comes down looks like the end of 2024 and the beginning of 2025, to me. And my question to you – I don't know if this is where his confusion is, but it's certainly mine – is that where the spending on

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Power/Forward or the investment in Power/Forward stops?

MR. BOBBY SIMPSON [DUKE]: Yes.

CHAIRMAN WHITFIELD: At the peak of that blue line. And you said it was a 10-year plan, so that would put you back to the end of 2014-2015. Am I hearing you correctly, or is it just an eight-year plan or could you explain that just a second?

MR. BOBBY SIMPSON [DUKE]: Yes, sir. It's a 10-year plan, and the 10 years start in '17 and run through '26.

CHAIRMAN WHITFIELD: Okay. So you still are investing or spending — making investment past 2025, up to 2027; is that correct?

MR. BOBBY SIMPSON [DUKE]: Yes. The intent of this analysis was to show that we're going to ramp up spending, and that is investing capital in the economy, and then we would ramp it down. So, you know, I'd have to go back and look at the numbers to see exactly what he used in '26 and '27, but I think the point is we're going to peak in our investment and that's the point of the blue curve, and then we're going to ramp it down.

CHAIRMAN WHITFIELD: Okay.

MR. BOBBY SIMPSON [DUKE]: The official 10-

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year window is 2017 to 2026. And it does show a ramp-down that takes you into 2027, and that's just a reflection of the fact that it takes time to ramp down spending. You don't just cut it off. Does that help?

CHAIRMAN WHITFIELD: A little. I guess what I'm confused about is, I think of the blue line — and maybe Commissioner Hamilton was thinking the same way. I think of the blue line as being Statewide benefits and not necessarily your spending. So if your spending is — or investment, rather, is decre- — I'm trying to correlate where the — I understand that, as you've stopped the investment, that your benefits are going to go down, but I'm trying to match or correlate the two together by this graph, and I'm having a hard time doing it, I guess is what I'm saying.

COMMISSIONER HAMILTON: Mr. Chairman?

CHAIRMAN WHITFIELD: Yes, sir, Commissioner Hamilton.

COMMISSIONER HAMILTON: My concern, I thought he was — this was economic benefits to the State.

CHAIRMAN WHITFIELD: And that's what I'm thinking, too. Is that not what that is?

MR. BOBBY SIMPSON [DUKE]: It is. It's

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absolutely what it is. So, the blue curve is showing – you know, as it says on the slide – the change in gross output. You know, the fact of the matter is there's details in that report that I'd have to get Dr. Von Nessen to explain, because I'm not the expert on it. But the intent is to show, in economic terms, such as gross domestic output, you know, what the benefits will be as a function of when we invest.

So as we ramp up the investment, the economic output benefits ramp up; and as we ramp down the investment, which starts in the year, according to the graph, 2025 or '26, those benefits are going to start to tail off, because the investment is tailing off.

CHAIRMAN WHITFIELD: Okay.

MR. BOBBY SIMPSON [DUKE]: But it's measured in economic output terms.

CHAIRMAN WHITFIELD: And I see your Statewide economic benefits curtailing. I guess what I don't – what I'm unable to kind of correlate to it is where the investment – I think you've said, though, verbally, 2017 to 2027, or a 10-year period. I'm just trying to visualize that on the graph. But, anyway, you've answered my question.

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MR. BOBBY SIMPSON [DUKE]: Okay.

CHAIRMAN WHITFIELD: And, next, if you could go to page 16 of your slides –

MR. BOBBY SIMPSON [DUKE]: [Indicating.]

[Reference: Presentation Slide 16]

CHAIRMAN WHITFIELD: – I just want to thank you for recognizing – like you mentioned specifically, Aynor, but I want to thank you for recognizing Longtown. I bet you you and I are the only people in this room that know where Longtown is. And that is very close to where I live, and, yes, I've seen the outages out there. And we're also, unfortunately, in a situation – I know you can't do anything about this – as Commissioner Elam said about telecom, we have almost zero cell service out there, too. So certainly that's got to be one of your most remote areas, and I appreciate you sharing it on a slide like this and bringing attention to it, because it certainly is a remote area and an area that I know you've had trouble with.

Lastly, I've got a couple of questions about percentages. If you could explain those to me, I think that will about do it. On page seven of your slides, early on –

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MR. BOBBY SIMPSON [DUKE]: [Indicating.]

[Reference: Presentation Slide 7]

CHAIRMAN WHITFIELD: — where you discuss DEC and DEP, you really talk about SAIDI indexes and SAIDI numbers, and that's certainly something we deal with a lot on the Critical Infrastructure Committee at NARUC, but why is DEC, shown on those graphs, worse than DEP? Why does the Duke Energy Carolinas territory seem to have worse numbers than Duke Energy Progress? When you talk about rural areas and older systems, I typically think of the DEP, the Progress area, the old Carolina Power & Light area being more remote, more rural, and I would've thought the SAIDI numbers would've been worse there. Could you explain those two graphs?

MR. BOBBY SIMPSON [DUKE]: Well, actually, the SAIDI numbers are worse for DEP, which is on the left. You know, lower is better? Does that make sense? So the DEP SAIDI is 239, almost four hours, and the DEC —

CHAIRMAN WHITFIELD: I'm sorry.

MR. BOBBY SIMPSON [DUKE]: Yeah.

CHAIRMAN WHITFIELD: I am looking at right to left. I'm sorry. I was thinking the one on the left was DEC. Okay. You've fixed that one.

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The next deals with a percentage also. You mentioned – and last time, also, in your allowable ex parte you mentioned – that the targeted underground program would significantly reduce outages by, I think, 30 percent, which is what you're stating today.

MR. BOBBY SIMPSON [DUKE]: Yes, sir.

CHAIRMAN WHITFIELD: And you also said – again, we're talking about the underground program would reduce SAIDI – did I get it right? Because this is on page – I don't see a number, but it's the targeted underground slide. But I think you said SAIDI would reduce by 10 to 15 percent? That's not on the slide. Page 13, that's it.

MR. BOBBY SIMPSON [DUKE]: [Indicating.]

[Reference: Presentation Slide 13]

CHAIRMAN WHITFIELD: You've said – the first bullet point – significantly reduce outages by 30 percent, is what I had down. But you also had that it would reduce SAIDI by 10 to 15 percent. Correct?

MR. BOBBY SIMPSON [DUKE]: That's correct.

CHAIRMAN WHITFIELD: Is that correct? And there was something else you said, something else by 5 percent. What was that?

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MR. BOBBY SIMPSON [DUKE]: I don't remember saying 5 percent.

CHAIRMAN WHITFIELD: It was something, another event, and I had events — other events by 5 percent. It was a lesser number than the SAIDI number.

MR. BOBBY SIMPSON [DUKE]: I may have been moving on to the hardening and resiliency.

CHAIRMAN WHITFIELD: Maybe it was —

MR. BOBBY SIMPSON [DUKE]: So what I tried to do is represent each of those three subsystem programs, in terms of event production and SAIDI reduction.

CHAIRMAN WHITFIELD: Maybe it was outage — you called that last part outage causing line faults. I don't know. But there was something else — I just wondered what the 5 percent number was that you said, and then when you — if you could, skip over the page 17.

MR. BOBBY SIMPSON [DUKE]: [Indicating.]

[Reference: Presentation Slide 17]

CHAIRMAN WHITFIELD: You're referring to the self-optimizing grid as improving SAIDI numbers by 30 to — did you say 30 to 40 percent?

MR. BOBBY SIMPSON [DUKE]: Yes, sir.

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CHAIRMAN WHITFIELD: Okay. So you've got several different things that can improve SAIDI, be it from the targeted underground program to the self-optimizing grid, or smart-thinking grid as you say.

MR. BOBBY SIMPSON [DUKE]: That's correct. Yeah, the point being that it gets back to the layered benefits and they work together. So some programs stop outages, some programs reduce impact when outages do occur. And so the self-optimizing grid is what – it doesn't stop an outage. It reacts to outages quickly and just reduces impact. That's why the SAIDI number – its contribution to SAIDI is higher than targeted undergrounding, which is an event stopper.

CHAIRMAN WHITFIELD: I see. Well, I think everything else that I had has certainly been asked by my fellow Commissioners. And at this time, I don't see any further questions. I certainly thank you for a very thorough presentation all by yourself up here, and we certainly appreciate it. It was very informative and very valuable for us to hear this and to be able to ask you these questions. So, we thank you.

And if there's nothing further – I'm going to

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look over at Mr. Nelson and see if ORS has anything or your attorney, Ms. Smith, has anything?

MS. SMITH: [Shaking head.]

CHAIRMAN WHITFIELD: Anything further?

MR. NELSON: No, sir.

CHAIRMAN WHITFIELD: Well, if not, we thank you, and this allowable ex parte is adjourned.

[WHEREUPON, at 12:15 p.m., the proceedings in the above-entitled matter were adjourned.]

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C E R T I F I C A T E

I, Jo Elizabeth M. Wheat, CVR-CM-GNSC, do hereby certify that the foregoing is, to the best of my skill and ability, a true and correct transcript of all the proceedings had in an Allowable Ex Parte Proceeding held before THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA in Columbia, South Carolina, according to my verbatim record of same.

IN WITNESS WHEREOF, I have hereunto set my hand, on this the 25th day of May, 2018.

Jo Elizabeth M. Wheat, CVR-CM/M-GNSC
Hearings Reporter, PSC/SC
My Commission Expires: January 27, 2021.